

MORASH, MELANIE

From: MORASH, MELANIE
Sent: Tuesday, December 01, 2015 1:51 AM
To: J. Wesley Hawthorne
Cc: Connell, Rebecca; Parker, Heather; Elizabeth Brown; Heather O'Cleirigh; Joseph Innamorati; Linda Niemeyer; Michele Yuen; Morgan Gilhuly; Nancy-Jeanne LeFevre; Peter Bennett; Peter Scaramella; Rebecca Mora; Shau Luen Barker; Shaun Moore; Soetebier, Kristen; Todd Maiden; Wendy Feng; Cynthia Woo; Lawrence McGuire; Leslie Lundgren; Rafael Rangell; Rose Condit; Wenqian Dou; DIAZ, ALEJANDRO; Estrada, Thelma; Harris-Bishop, Rusty; Lyons, John; Maldonado, Lewis; MORASH, MELANIE; Plate, Mathew; Shaffer, Caleb; Stralka, Daniel; Yogi, David
Subject: EPA Comments - Revised Mitigation Plans - Residences #21, 84/85, 105/124/125 - Please submit revised plans responsive to comments by Friday, Dec. 4th
Attachments: DRAFT_Mitigation Plan Cover Letter_Owner.docx; EPA QA Office Comments_Mitigation Plan_RES 105-124-125_11-30-2015.pdf; EPA QA Office Comments_Mitigation Plan_RES 084-085_11-30-2015.pdf; EPA QA Office Comments_Mitigation Plan_RES 021_11-30-2015.pdf

Good morning, Wes,

Thank you for submitting mitigation plans for the three residences referenced above. The following are EPA's comments on these plans.

Please revise and resubmit these plans to EPA based on these comments by Friday, Dec. 4th. Please also let me know if you would like to schedule a call to discuss further. You are also welcome to contact Matt Plate of EPA's Quality Assurance Office, at 415-972-3799 if you have technical questions.

I have also attached a draft letter, for your review, that would accompany these mitigation plans when we provide them to the property owners for their review and approval. **Please provide comments on this draft letter to owners by Monday, Dec. 7th.**

General Comments

SMDS Piping. The proposed mitigation plan calls for "laying evenly spaced perforated pipe (3 to 4 inches in diameter) on the floor of the crawlspace. Perforated pipe may be all or partially entrenched due to crawlspace height approximately 20 inches."

At a minimum, the perforated pipe should be 4-inch diameter perforated pipe (not 3-inch) with one pipe laid midway along the length and one pipe laid midway along the width, intersecting at the center of the crawlspace, with a T-connection.

In addition, this perforated pipe should be installed such that it does not at all reduce the existing height between the subfloor and ground. This means installing the perforated pipe in a trench that is filled with gravel level with the ground. This can be done by digging 6-inch by 6-inch trenches in the crawlspace soil and laying the 4-inch perforated pipe into the trench with one row of perforations facing up and then backfilling the trench with gravel to be level with the crawlspace ground. In this way, access to the crawlspace will not be impaired (e.g. causing reduced clearance below the subfloor by pipes laid on top of the ground).

Vapor Barrier. To minimize punctures and abrasion penetrations of the vapor barrier a minimum of a 20-mil vapor barrier should be installed over the ground (not 12 mil). Install a continuous 20-mil vapor barrier (e.g. Cleanspace 20 mil vapor retarder or VaporBlock Plus 20, or equivalent).

Suction Fan. The fan operation audible alarm needs to have the capability of being silenced so that the occupants are not disturbed while waiting for a Locus technician to respond. This alarm needs to be installed in an easily accessible location in the residence (not the crawlspace) and should consist of BOTH an audible alarm and a flashing light.

The audible alarm should be able to be silenced, while the flashing light should remain flashing until the fan is fixed. The costs of the fan operation and maintenance (e.g. motor and/or blower replacement) should be estimated for the anticipated life of the system and the owners should be compensated for these incurred costs. The exhaust discharge point should have a bird screen installed over the outlet (i.e. ¼ inch stainless steel wire screen).

Schedule. The implementation schedule on page 3 states “within 120 calendar days of the property owners’ approval to proceed, the mitigation plan will be implemented”. As the mitigation installation is estimated to take 1-3 days, this 120 day period should be reduced to no more than 14 days.

Operation and Maintenance. On page 4, it is stated, “at the time the vapor intrusion mitigation is no longer needed”. There is insufficient description as to how it is determined that “the vapor intrusion mitigation is no longer needed”. See building-specific comments, attached to this e-mail, for further discussion of this item.

Post-Mitigation Sampling Plan. Regarding the mitigation plan for Residence #105/124/125, the proposed air testing is only for the Residence #105 crawlspace and living space and not in Residences #124/125, if the Residence #105 air samples are below 0.48 µg/m³. Post-mitigation air testing should be conducted in each ground-floor unit, as the TCE transport between ground and crawlspace and crawlspace and indoor air can vary significantly for the different units.

Additional Building-Specific Comments

See three attached files.

Regards,

Melanie

Melanie Morash, Project Manager
California Site Cleanup Section I, Superfund Division

US EPA Region 9
75 Hawthorne Street (SFD-7-1)
San Francisco, CA 94105

(415) 972-3050 [phone]
morash.melanie@epa.gov

From: J. Wesley Hawthorne [<mailto:hawthornej@locustec.com>]

Sent: Friday, November 20, 2015 6:15 PM

To: MORASH, MELANIE <morash.melanie@epa.gov>

Cc: 'Barker, Shau-Luen (ShauLuen.Barker@philips.com)' <ShauLuen.Barker@philips.com>; 'Maiden, Todd O.' <TMaiden@ReedSmith.com>; 'Niemeyer, Linda' <Linda.Niemeyer@ngc.com>; 'Heather.OCleirigh@amd.com'

<Heather.OCleirigh@amd.com>; 'Leslie Lundgren' <leslie.lundgren@cbifederalservices.com>

Subject: Mitigation Plan for Residence #105/124/125

Melanie:

In accordance with your request, please find attached a mitigation plan for the subject residence at the Triple Site.

J. Wesley Hawthorne, PE, PG

Senior Vice President

Locus Technologies

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 9

**75 Hawthorne Street
San Francisco, CA 94105-3901**

November 30, 2015

MEMORANDUM

SUBJECT: Mitigation Plan for Residences 084 and 085 (RES084/085), Triple Site Superfund Site, Sunnyvale, California (QA Office Document Control Number [DCN] SUPF0006SV1)

FROM: Mathew Plate, Environmental Scientist
Quality Assurance Office, EMD-3-2

THROUGH: Eugenia McNaughton, Manager
Quality Assurance Office, EMD-3-2

TO: Melanie Morash, Remedial Project Manager
CA Site Clean Up Section 3, SFD-7-1

This Mitigation Plan which includes mitigation sampling was reviewed based on guidance provided in the following USEPA documents:

- *Sampling and Analysis Plan (SAP) Guidance and Template (Version 4)* (R9QA/002.1, May 2014)
- *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations* (EPA QA/R-5, March 2001)
- *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (USEPA OSWER Publication 9200.2-154, June 2015)
- *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Final*, (California Department of Toxic Substances Control, October 2011)
- *PROPOSED STANDARD Soil Gas Mitigation Standard for Existing Homes*, (ANSI/AARST SGM-SF 201x, September 2015)

This plan lacks specifics regarding mitigation and quality assurance for measurements. It is recommended that engineering specifications be included in a revised plan or part of as-built documentation. An operations, monitoring, and maintenance plan that includes quality assurance for mitigation system operations and monitoring should be developed. Specific concerns are provided below. Questions or comments regarding this review should be referred to me at (415) 972-3799 / plate.mathew@epa.gov.

Concerns

1. [Description, Technical Specifications] The description of the system provided includes some technical specifications. These specifications are not complete and the plan does not provide any engineering diagrams of the proposed system. Information that should be provided includes:

- Technical specifications for the fan
- Pressure and flow specifications for the system
- Electrical specifications for the system
- Location and design of sampling ports
- Proposed signage
- System design diagrams

This section does specify concentration reduction requirements for the system based on the previous indoor air and crawlspace data. Because the measurements taken represent only a snapshot of potential vapor intrusion, the system should be designed to outperform these requirements with a level of confidence. The goal for abatement in the crawlspace should be $0.48 \mu\text{g}/\text{m}^3$ for trichloroethene (TCE), not $2 \mu\text{g}/\text{m}^3$. If concentrations lower than $0.48 \mu\text{g}/\text{m}^3$ cannot be achieved in the crawlspace, more frequent long-term monitoring is required.

2. [Potential Alternatives] If system improvements fail to consistently reduce TCE below the target concentration, evaluation of other conduits between the subsurface and indoor air, such as utility lines, should be investigated. Additional information may need to be collected to rule out potential contributions from indoor air background sources.
3. [Operation and Maintenance of Proposed Mitigation – Framework] The monitoring and inspection requirements in this section should include details and criteria in an operations, monitoring, and maintenance (OMM) plan. The OMM plan can apply to all residential mitigation systems installed and should include quality assurance for all measurements conducted.

For example, there is no discussion of what will trigger the activation of the system alarm. Generally, it is recommended that the alarm be connected to a continuous pressure measurement upstream of the fan. This pressure measurement should be correlated to system flow during the system commissioning process and based on a percentage of total flow rate.

4. [Post-Mitigation Sampling Plan to Confirm Success of Mitigation] Information about post-mitigation sampling, with applicable quality assurance, should be included in the OMM plan. The OMM plan should address long-term indoor air monitoring. This building-specific plan should specify the number and locations of samples that will be collected to verify the performance of the specific mitigation system.

5. [General, Testing of Effluent] In addition to the testing proposed in this plan, the effluent from the abatement system should be characterized to
 - use as a benchmark for evaluation of the system;
 - determine if outdoor air concentrations might be adversely impacted by emissions from individual or multiple mitigation systems;
 - estimate emissions rates and mass removal;
 - indicate whether system emissions are below regulatory thresholds for source controls.
6. [General, QA/QC] The QA/QC for the proposed measurements should reference an EPA approved Quality Assurance Project Plan or Sampling and Analysis Plan (SAP). It is recommended that an OMM that meets EPA SAP requirements include measurements taken in the residential mitigation program.
7. [General, Adverse Effects] This plan does not address how the mitigation system will control for adverse effects such as back draft of combustion appliances.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 9

**75 Hawthorne Street
San Francisco, CA 94105-3901**

November 30, 2015

MEMORANDUM

SUBJECT: Mitigation Plan for Residences 105, 124 and 125 (RES105/124/125),
Triple Site Superfund Site, Sunnyvale, California (QA Office Document
Control Number [DCN] SUPF0008SV1)

FROM: Mathew Plate, Environmental Scientist
Quality Assurance Office, EMD-3-2

THROUGH: Eugenia McNaughton, Manager
Quality Assurance Office, EMD-3-2

TO: Melanie Morash, Remedial Project Manager
CA Site Clean Up Section 3, SFD-7-1

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- *PROPOSED STANDARD Soil Gas Mitigation Standard for Existing Homes*,
(ANSI/AARST SGM-SF 201x, September 2015)

This plan lacks specifics regarding mitigation and quality assurance for measurements. It is recommended that engineering specifications be included in a revised plan or part of as-built documentation. Concentrations in the crawlspace and significantly above EPA's risk range and need to be considered in implementation of this mitigation. An operations, monitoring, and maintenance plan that includes quality assurance for mitigation system operations and monitoring should be developed. Specific concerns are provided below. Questions or comments regarding this review should be referred to me at (415) 972-3799 / plate.mathew@epa.gov.

Concerns

1. [Summary of All Relevant Data] The data collected indicates the potential for significant vapor intrusion into this building. It is recommended that additional crawlspace and indoor air locations be selected to ensure the protectiveness of this mitigation.
2. [Proposed Mitigation Plan] Mitigation of this crawlspace presents significant challenges because of the limited clearance and elevated concentrations of trichloroethene (TCE). It is recommended that a worker health and safety plan be developed for mitigation of this space that addresses confined space and elevated TCE.
3. [Description, Technical Specifications] The description of the system provided includes some technical specifications. These specifications are not complete and the plan does not provide any engineering diagrams of the proposed system. Information that should be provided includes:
 - Technical specifications for the fan
 - Pressure and flow specifications for the system
 - Electrical specifications for the system
 - Location and design of sampling ports
 - Proposed signage
 - System design diagrams

This section does specify concentration reduction requirements for the system based on the previous indoor air and crawlspace data. Because the measurements taken represent only a snapshot of potential vapor intrusion, the system should be designed to outperform these requirements with a level of confidence. The goal for abatement in the crawlspace should be $0.48 \mu\text{g}/\text{m}^3$ for TCE, not $2 \mu\text{g}/\text{m}^3$. If concentrations lower than $0.48 \mu\text{g}/\text{m}^3$ cannot be achieved in the crawlspace, more frequent long-term monitoring is required.

4. [Potential Alternatives] If system improvements fail to consistently reduce TCE below the target concentration, evaluation of other conduits between the subsurface and indoor air, such as utility lines, should be investigated. Due to the concentrations present in the crawlspace of this building it may not be possible to effectively bring concentration below the EPA risk range for TCE. If the system proves to only be partially effective, combining sub-membrane depressurization with other technologies, such as soil vapor extraction, should be considered.
5. [Operation and Maintenance of Proposed Mitigation – Framework] The monitoring and inspection requirements in this section should include details and criteria in an operations, monitoring, and maintenance (OMM) plan. The OMM plan can apply to all residential mitigation systems installed and should include quality assurance for all measurements conducted.

For example, there is no discussion of what will trigger the activation of the system alarm. Generally, it is recommended that the alarm be connected to a continuous pressure measurement upstream of the fan. This pressure measurement should be correlated to system flow during the system commissioning process and based on a percentage of total flow rate.

6. [Post-Mitigation Sampling Plan to Confirm Success of Mitigation] Information about post-mitigation sampling, with applicable quality assurance, should be included in the OMM plan. The OMM plan should address long-term indoor air monitoring. This building-specific plan should specify the number and locations of samples that will be collected to verify the performance of the specific mitigation system.
7. [General, Testing of Effluent] In addition to the testing proposed in this plan, the effluent from the abatement system should be characterized to
 - use as a benchmark for evaluation of the system;
 - determine if outdoor air concentrations might be adversely impacted by emissions from individual or multiple mitigation systems;
 - estimate emissions rates and mass removal;
 - indicate whether system emissions are below regulatory thresholds for source controls.
8. [General, QA/QC] The QA/QC for the proposed measurements should reference an EPA approved Quality Assurance Project Plan or Sampling and Analysis Plan (SAP). It is recommended that an OMM that meets EPA SAP requirements include measurements taken in the residential mitigation program.
9. [General, Adverse Effects] This plan does not address how the mitigation system will control for adverse effects such as back draft of combustion appliances.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 9

**75 Hawthorne Street
San Francisco, CA 94105-3901**

November 30, 2015

MEMORANDUM

SUBJECT: Mitigation Plan for Residence 021 (RES021), Triple Site Superfund Site, Sunnyvale, California (QA Office Document Control Number [DCN] SUPF0007SV1)

FROM: Mathew Plate, Environmental Scientist
Quality Assurance Office, EMD-3-2

THROUGH: Eugenia McNaughton, Manager
Quality Assurance Office, EMD-3-2

TO: Melanie Morash, Remedial Project Manager
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- **PROPOSED STANDARD Soil Gas Mitigation Standard for Existing Homes**, (ANSI/AARST SGM-SF 201x, September 2015)

This plan lacks specifics regarding mitigation and quality assurance for measurements. It is recommended that engineering specifications be included in a revised plan or part of as-built documentation. An operations, monitoring, and maintenance plan that includes quality assurance for mitigation system operations and monitoring should be developed. Specific concerns are provided below. Questions or comments regarding this review should be referred to me at (415) 972-3799 / plate.mathew@epa.gov.

Concerns

1. [Description, Technical Specifications] The description of the system provided includes some technical specifications. These specifications are not complete and the plan does not provide any engineering diagrams of the proposed system. Information that should be provided includes:

- Technical specifications for the fan
- Specifications for sealing crawlspace vents inside the enclosed patio
- Pressure and flow specifications for the system
- Electrical specifications for the system
- Location and design of sampling ports
- Proposed signage
- System design diagrams

This section does specify concentration reduction requirements for the system based on the previous indoor air and crawlspace data. Because the measurements taken represent only a snapshot of potential vapor intrusion, the system should be designed to outperform these requirements with a level of confidence. The goal for abatement in the crawlspace should be $0.48 \mu\text{g}/\text{m}^3$ for trichloroethene (TCE), not $2 \mu\text{g}/\text{m}^3$. If concentrations lower than $0.48 \mu\text{g}/\text{m}^3$ cannot be achieved in the crawlspace, more frequent long-term monitoring is required.

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4. [Post-Mitigation Sampling Plan to Confirm Success of Mitigation] Information about post-mitigation sampling, with applicable quality assurance, should be included in the OMM plan. The OMM plan should address long-term indoor air monitoring. This building-specific plan should specify the number and locations

Melanie Morash

November 30, 2015

of samples that will be collected to verify the performance of the specific mitigation system.

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 - estimate emissions rates and mass removal;
 - indicate whether system emissions are below regulatory thresholds for source controls.
6. [General, QA/QC] The QA/QC for the proposed measurements should reference an EPA approved Quality Assurance Project Plan or Sampling and Analysis Plan (SAP). It is recommended that an OMM that meets EPA SAP requirements include measurements taken in the residential mitigation program.
7. [General, Adverse Effects] This plan does not address how the mitigation system will control for adverse effects such as back draft of combustion appliances.
8. [General, Attached Garage] This plan does not sufficiently address how the attached slab-on-grade garage will be incorporated into the mitigation and monitoring strategy. The following should be addressed:
 - Indoor air samples should be collected in the garage to determine if it is contributing to indoor air vapor concentrations
 - Currently the garage is used for storage, evaluations for changes in use of this space are needed
 - If the mitigation measures are not effective, the garage may need to be evaluated for mitigation